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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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Application of :  
Akihiro IINO et al. :  
Serial No. 09/369,090 : Group Art Unit - 2834  
Filed: August 5, 1999 : Examiner - Mark O. Budd  
For: ULTRASONIC MOTOR AND :  
ELECTRONIC APPARATUS :  
HAVING ULTRASONIC MOTOR : Docket No. S004-3747 (RCE)

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MS APPEAL-BRIEFS PATENTS  
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REPLY BRIEF UNDER 37 C.F.R §41.41

S I R:

Pursuant to 37 C.F.R. §41.41, appellants present this brief in reply to the Examiner's Answer dated December 23, 2004.

In the brief on appeal filed January 6, 2003, appellants presented arguments addressing the rejections of claims 1, 2, 7 and 9 under 35 U.S.C. §102(b) and claims 4, 6 under 35 U.S.C. §103(a) raised by the Examiner in the final Office Action. In responding to appellants' arguments, the

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Examiner has raised new points of argument with respect to the prior art rejections of the claims. These new points of arguments are addressed below.

At the outset, it is noted that the Examiner has withdrawn the corresponding rejections of claims 1, 2, 4, 6, 7 and 9 under 35 U.S.C. §§102, 103 based on U.S. Patent No. 4,959,580 to Vishnevsky et al. (Examiner's Answer, pg. 3).

**Rejection of Claims 1, 7, 9 Under 35 U.S.C. §102(b)**

The Examiner has maintained the rejection of claims 1, 7 and 9 under 35 U.S.C. §102(b) as being anticipated by Katsuma or Miyazawa raised in the final Office Action. However, the Examiner for the first time specifies the elements of the ultrasonic motors disclosed in the references purportedly corresponding to the elements of the ultrasonic motor recited in claims 1, 7 and 9.

**Argument for Independent Claim 1 - Rejection Based on Katsuma**

Independent claim 1 requires a substrate having a conductor pattern for conveying a drive signal from a drive circuit, a piezoelectric vibrator provided on the substrate for undergoing oscillating movement in response to the drive signal so as to contact the movable member and generate the drive force to drive the movable member, and a support member provided on the substrate for mechanically fixedly supporting

the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator on the substrate and transmitting the drive signal from the conductor pattern to electrodes of the piezoelectric vibrator.

In the Examiner's Answer, the Examiner contends that Fig. 7 of Katsuma discloses an ultrasonic motor having a movable member (i.e., rotating member) 9, a substrate (i.e., wiring plate) 51 having a conductor pattern (i.e., electrode patterns 51<sub>c1-d2</sub>), a piezoelectric vibrator (i.e., vibrating member and electro-strain element) 2, 3 provided on the substrate 51, and a support member 4 (i.e., absorber) provided on the substrate 51 for mechanically fixedly supporting the piezoelectric vibrator 2, 3 on the substrate 51 and transmitting the drive signal from the conductor pattern to electrodes (e.g., electrode patterns 3<sub>c1-d2</sub>) of the piezoelectric vibrator 2, 3 (Examiner's Answer, pgs. 4-6). Appellants vigorously disagree with the Examiner's interpretation of the disclosure in Katsuma and with the application of Katsuma in the rejection of independent claim 1.

Appellants respectfully submit that the element denoted by reference numeral 4 in Katsuma does not correspond to the support member recited in independent claim 1. The element denoted by reference numeral 4 in Katsuma is an

absorber disposed in contact with the substrate 51 which serves to absorb the vibration of the vibrating member 2 (col. 3, lines 67-68). There is no disclosure in Katsuma that the absorber 4 provides any type of "supporting" function, and specifically the function of "mechanically fixedly supporting" the piezoelectric vibrator 2, 3 to the substrate 51. Stated otherwise, the only disclosed function for the absorber is to absorb vibrations of the vibrating member 2 during operation of the ultrasonic motor. Furthermore, it is evident from the construction (i.e., arrangement of parts) of the ultrasonic motor shown in Fig. 7 of Katsuma that the absorber 4 does not mechanically fixedly support the piezoelectric vibrator to the substrate, as required by the explicitly recited function of the support member in independent claim 1.

Moreover, independent claim 1 further explicitly recites that the support member transmits the drive signal from the conductor pattern to electrodes of the piezoelectric vibrator. It is evident that no such transmitting function is accomplished by the absorber 4 of Katsuma (i.e., Katsuma discloses that the absorber 4 is made of rubber (col. 3, lines 67, 68)).

Appellants further note that the ultrasonic motor disclosed by Katsuma includes a base 7, a pressing plate 15, springs 17, and bolts 16 which, when connected together, form

a connecting assembly for maintain the integrity of the motor (col. 3, lines 50-59). Even if this connecting assembly disclosed by Katsuma were interpreted as a "support member" for the motor, it is evident that such "support member" is neither provided on the substrate nor does it transmit a drive signal from the conductor pattern to electrodes of the piezoelectric vibrator, as required by the support member recited in independent claim 1.

Moreover, independent claim 1 further requires that the support member mechanically fixedly supports the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator. Since the absorber 4 in Katsuma does not provide a supporting function, as set forth above, it is evident that the absorber does not support the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator, as recited in independent claim 1. Likewise, there is no disclosure or suggestion in Katsuma that the connecting assembly (i.e., base 7, pressing plate 15, springs 17, bolts 16) supports the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator, as recited in independent claim 1.

Thus Katsuma does not anticipate the structural combination of the ultrasonic motor recited in independent

claim 1 because it does not disclose or describe a support member which (1) mechanically fixedly supports the piezoelectric vibrator on the substrate (2) at a point corresponding to a node of vibration of the piezoelectric vibrator, and which (3) transmits the drive signal from the conductor pattern to electrodes of the piezoelectric vibrator.

**Argument for Independent Claim 1 - Rejection Based on Miyazawa**

In the Examiner's Answer, the Examiner contends that Fig. 44 of Miyazawa discloses an ultrasonic motor having a movable member (i.e., projections) 2a-27, a substrate (i.e., circuit substrate) 47 having a conductor pattern (i.e., circuit pattern 47a), a piezoelectric vibrator (i.e., stator and electrode) 2-27, 3-27 provided on the substrate 47, and a support member (i.e., conductor and flange) 46, 2e-27 provided on the substrate 47 for mechanically fixedly supporting the piezoelectric vibrator 2-27, 3-27 on the substrate 47 and transmitting the drive signal from the conductor pattern to electrodes (e.g., electrode pattern 3a-27) of the piezoelectric vibrator 2-27, 3-27 (Examiner's Answer, pgs. 3-6). Appellants vigorously disagree with the Examiner's interpretation of the disclosure in Miyazawa and with the application of Miyazawa in the rejection of independent claim 1.

Appellants respectfully submit that the elements denoted by reference numerals 46 and 2e-27 do not correspond to the support member recited in independent claim 1. Reference numeral 46 denotes a conductor having a conductor member 46a for coupling the circuit pattern 47a of the substrate to the electrode pattern 3a-27 of the piezoelectric vibrator (col. 18, lines 61-64). It is evident that the conductor 46 does not provide any support function, and more specifically a function of "mechanically fixedly supporting the piezoelectric vibrator...on the substrate", as recited in independent claim 1.

The element denoted by 2e-27 in Miyazawa corresponds to a flange portion of the stator 2-27 which makes contact with a base plate 4-27 for the purpose of maintaining a suitable compression value (col. 19, lines 6-7). The base plate 4-27 and the stator 2-27 (via the flange 2e-27) are secured together by a screw 6-27 in order to press the electrode pattern 3a-27, circuit pattern 47a, and the conductor member 46a together with respect to one another (col. 18, line 67 to col. 19, line 4).

Thus, should the screw 6-27, the flange portion 2e-27 of the stator 2-27, and the base plate 4-27 in Miyazawa be interpreted as the "support member" for supporting the piezoelectric vibrator on the substrate 47 (i.e., that substrate 47 is mounted on the base plate 4-27), such "support

member" does not function to transmit the drive signal from the conductor pattern to electrodes of the piezoelectric vibrator, as required by independent claim 1. In Miyazawa, such "transmitting" function is accomplished by the conductor 46 and conductor member 46a which do not provide any support function as discussed above.

Moreover, independent claim 1 further requires that the support member mechanically fixedly supports the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator. Since the conductor 46 and conductor member 46a in Miyazawa does not provide a supporting function, as set forth above, it is evident that the conductor 46 and conductor member 46 do not support the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator, as recited in independent claim 1. Likewise, there is no disclosure or suggestion in Miyazawa that the combination of the screw 6-27, the flange portion 2e-27 of the stator 2-27, and the base plate 4-27 supports the piezoelectric vibrator at a point corresponding to a node of vibration of the piezoelectric vibrator, as recited in independent claim 1.

Thus Miyazawa does not anticipate the structural combination of the ultrasonic motor recited in independent claim 1 because it does not disclose or describe a support



member which (1) mechanically fixedly supports the piezoelectric vibrator on the substrate (2) at a point corresponding to a node of vibration of the piezoelectric vibrator, and which (3) transmits the drive signal from the conductor pattern to electrodes of the piezoelectric vibrator.

**Argument for Dependent Claim 7**

Dependent claim 7 is patentable over Katsuma and Miyazawa for the same reasons as independent claim 1 from which it depends. In addition, claim 7 is separately patentable from independent claim 1 because it requires that the support member is provided with at least a part of a drive circuit for producing the drive signal. No corresponding structural feature is disclosed or suggested by Katsuma and Miyazawa.

For example, contrary to the Examiner's contention (Examiner's Answer, pgs. 6, 9), it is evident that neither the absorber 4 nor the components of the connecting assembly (i.e., base 7, pressing plate 15, springs 17, bolts 16) in Katsuma is provided with at least a part of a drive circuit for producing the drive signal. Likewise, it is evident that neither the screw 6-27, the flange portion 2e-27 of the stator 2-27, nor the base plate 4-27 in Miyazawa is provided with at least a part of a drive circuit for producing the drive signal.

**Rejection of Claim 2 Under 35 U.S.C. §102(b)**

**Argument for claim 2**

Dependent claim 2 is patentable over Katsuma for the same reasons as independent claim 1 from which it depends. In addition, claim 2 is separately patentable from independent claim 1 because it requires that the support member has sufficient elasticity to elastically urge the piezoelectric vibrator against a moving member to drive the moving member in response to oscillating movement of the piezoelectric vibrator. The Examiner contends that this claimed feature is taught by Katsuma which discloses that the absorber 4 is elastic (Examiner's Answer, pg. 6). Appellants vigorously disagree with the Examiner's contention.

As discussed above, the absorber 4 in Katsuma does not correspond to the support member for performing the corresponding functions recited in independent claim 1, from which claim 2 depends. Thus, while disclosed to be elastic, the absorber 4 in Katsuma clearly does not elastically urge the piezoelectric vibrator against a moving member to drive the moving member in response to oscillating movement of the piezoelectric vibrator, as required by the support member of claim 2. In Katsuma, the urging (e.g., whether by an elastic member or not) of the piezoelectric vibrator is presumably accomplished by one or more of the base 7, pressing plate 15,

springs 17, and bolts 16 which are connected together to form the connecting assembly for maintaining the integrity of the motor (col. 3, lines 50-59).

**Rejection of Claims 4 and 6 Under 35 U.S.C. §103(a)**

**Argument for claim 4**

Dependent claim 4 is patentable over Katsuma for the same reasons as independent claim 1 from which it depends. In addition, claim 4 is separately patentable from independent claim 1 because it requires that the support member comprises part of the substrate. While recognizing that neither Katsuma nor Miyazawa teaches a support structure for the piezoelectric vibrator which comprises part of a substrate having a conductor pattern, the Examiner contends that one of ordinary skill in the art would have found it obvious to integrate the support structure with the substrate as routine skill in the art (Examiner's Answer, pg. 7). Appellants vigorously disagree with the Examiner's contention.

As discussed above, the only structure in Katsuma which may fairly be construed as the "support member" recited in independent claim 1, from which claim 4 depends, is the connecting assembly (i.e., base 7, pressing plate 15, springs 17, bolts 16). It is evident that one skilled in the art, upon reviewing Katsuma, would not be led to integrate any of

the components of the connecting assembly with the substrate 51 because such integration would render the structure of the ultrasonic motor complex, which is contrary to Katsuma's desire to provide an ultrasonic motor having a simple structure (col. 3, lines 9-12). More specifically, the integration of one or more of the base 7, pressing plate 15, springs 17, bolts 16 to the substrate 51, even if possible, would make it difficult, if not impossible, to readily disassemble Katsuma's ultrasonic motor for repair and/or maintenance.

With respect to Miyazawa, it is evident from the embodiment of the ultrasonic motor shown in Fig. 44 that one skilled in the art would not be led to integrate any of the structure providing the support function (i.e., the flange 2e-27, base plate 4-27, bolt 6-27) with the circuit substrate 47 because such integration would render the ultrasonic motor difficult, if not impossible, to manufacture, which is contrary to the teaching in Miyazawa (col. 2, lines 7-8).

Thus the subject matter of dependent claim 4 is not rendered obvious by Katsuma or Miyazawa because Katsuma and Miyazawa do not suggest the modifications that would be needed to replicate the claimed invention. In the context of obviousness rejections based upon the purported obviousness of effecting a required modification, the Federal Circuit has

held that "[t]he mere fact that the prior art may be modified in [a given] manner ... does not make the modification obvious unless the prior art suggested the desirability of the modification". In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). There is nothing in Katsuma and Miyazawa that would have suggested modifying the structure of the ultrasonic motor to achieve the specific structure of the ultrasonic motor recited in dependent claim 4.

#### **Related Appeals and Interferences**

The Examiner contends that the main brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal (Examiner's Answer, pg 3).

Appellants respectfully point out that the main brief does contain the required statement regarding related appeals and interferences (see part 2, pgs. 1-2 of the main brief).

In light of the arguments and showing made herein and the arguments presented in the main brief, appellants respectfully submit that the rejection of claims 1, 7 and 9 under 35 U.S.C. §102(b) as being anticipated by Katsuma or Miyazawa, the rejection of claim 2 under 35 U.S.C. §102(b) as being anticipated by Katsuma, and the rejection of claims 4 and 6 under 35 U.S.C. §103(a) as being unpatentable over Katsuma or Miyazawa are in error and should not be sustained.

Respectfully submitted,

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February 22, 2005

Date